Chapter I: Purpose and Need

Introduction

History of Cascades Diversion Dam

Cascades Diversion Dam (dam) is located on the main stem of the Merced Wild and Scenic River in Yosemite National Park at an elevation of 3,800 feet near the intersection of El Portal Road and Big Oak Flat Road (figure I-1). Cascades Diversion Dam was constructed in 1917 to divert the flow of the main stem of the Merced River into a hydroelectric generating facility. The dam itself consists of "cribs" formed by logs or square timbers spiked together. These cribs were then filled with boulders and rocks and were anchored by concrete facing roughly 18 feet below the crest of the dam. The cribs were sheathed with rough-hewn redwood boards, which are visible during periods of low water. The dam spans 184 feet across, with a crest height of about 17 feet, flanked by 30-foot-high concrete abutments. While in operation, the hydroelectric generating facility provided a maximum output of 2,000 kilowatts[1] of electricity. The hydroelectric facility was taken off line in 1985 and 1986 because it was deteriorated and outdated. Turbines and other equipment were removed from the powerhouse, and the majority of the penstock was removed.

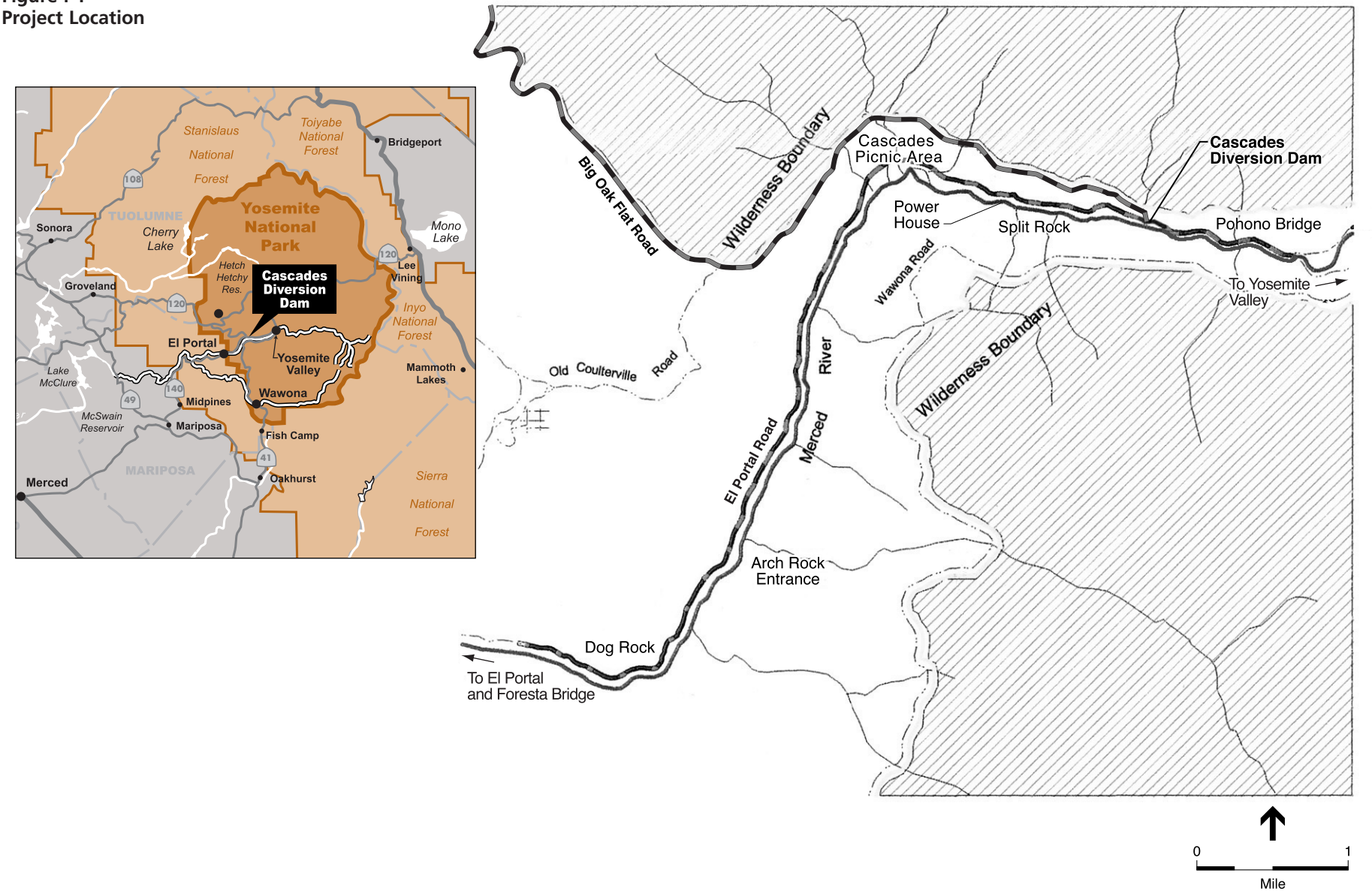
Some elements of the former hydroelectric generating facility still remain, including abutments that flank the dam, an intake structure, a screenhouse, 300 feet of concrete penstock (which historically conveyed water from the dam to the powerhouse), the powerhouse, and the transmission lines. Today the powerhouse is used as a transfer facility from Pacific Gas and Electric Company transmission lines to National Park Service transmission lines. The dam, abutments, intake structure, and screenhouse remain as they were when decommissioned in 1986.

As part of the decommissioning of the hydroelectric facility, the National Park Service determined that Cascades Diversion Dam and ancillary facilities would be removed. Dam removal was to occur in 1999 but was halted until an approved comprehensive management plan for the Merced Wild and Scenic River was completed. A record of decision on the *Merced Wild and Scenic River Comprehensive Management Plan* and its *Final Environmental Impact Statement* was signed in August 2000 and later revised in November 2000.

Cascades Diversion Dam and intake structure with screens were determined to be eligible for nomination to the National Register of Historic Places in 1982 (NPS 1982). The National Park Service has completed all cultural resource compliance procedures required under the National Historic Preservation Act for removal of the dam and associated features (NPS 1987b). Refer to Chapter VI, Consultation and Coordination, for a history of environmental compliance related to Cascades Diversion Dam.

[1] Below the 5,000-kilowatt capacity requiring federal licensing under current federal law.

Figure I-1
Project Location



SOURCE: National Park Service 1997; Environmental Science Associates

Purpose Of and Need For the Project

Purpose Of the Cascades Diversion Dam Removal Project

The purpose of the Cascades Diversion Dam Removal Project is to remove an unnatural obstruction on the Merced River and to restore the river's natural free-flowing condition. This removal project is consistent with the Wild and Scenic River guidance provided in the *Merced Wild and Scenic River Comprehensive Management Plan* (Merced River Plan) (NPS 2001a) and will meet the direction of the *Yosemite Valley Plan* (NPS 2000a), which calls for the dam's removal.

Need For the Cascades Diversion Dam Removal Project

Cascades Diversion Dam is classified as a high-hazard structure (USBR 1997). It is in unsatisfactory condition due to flood damage sustained in 1997 and to continuing deterioration associated with age. In addition, the dam no longer serves a useful purpose – water is not diverted from the site to generate electricity or for other uses, and the impoundment does not regulate high water. Removal of the existing dam structure is necessary to prevent possible uncontrolled and sudden failure, which could result in a release of impounded water and the deposition of concrete and timber debris, grouted rockfill, and impounded sediment along the downstream channel. Such an occurrence could pose a considerable threat to valued resources (such as aquatic life, scenic vistas, and recreational opportunities), infrastructure (El Portal Road, wastewater, telephone, and electrical lines), and human life.

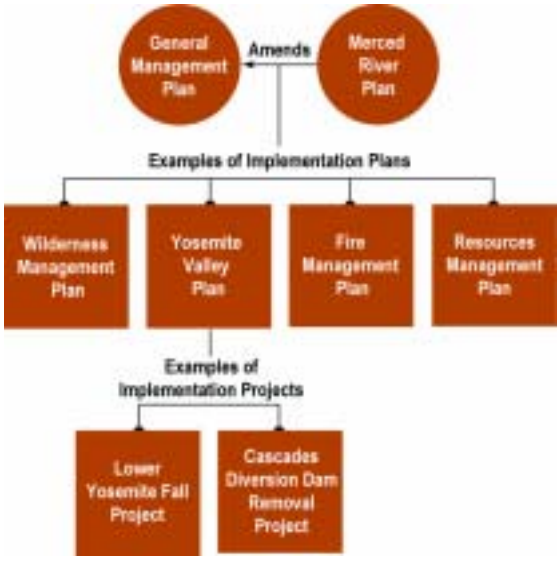
In addition, the National Park Service is entrusted with conserving and restoring park values. This responsibility includes protecting the biological and physical processes that created the park, along with scenic features, natural landscapes, and native plants and wildlife. The removal of the dam would work toward fulfilling this mandate by restoring this segment of the Merced River.

Planning Context

Relationship to Yosemite National Park Plans

Planning in Yosemite National Park takes two different forms: general management planning and implementation planning. General management plans are required for national parks by the National Park and Recreation Act of 1978.

The purpose of a general management plan is to set a "clearly defined direction for resource preservation and visitor use" (NPS 1998) and provide general directions and policies to guide planning and management in the park. The *General Management Plan* is the overall planning document for Yosemite National Park.



The Merced River Plan is a general management plan that guides management of the Merced Wild and Scenic Corridor. In designating the Merced River as a Wild and Scenic River, Congress authorized the National Park Service to prepare a management plan for the river by making appropriate revisions to the park's *General Management Plan* (16 United States Code 1274[a][62]). The Merced River Plan, which amended the *General Management Plan* in certain respects, provides a framework for decision-making on future management actions within the Merced Wild and Scenic River corridor. The Cascades Diversion Dam Removal Project complies with conditions outlined in the Merced River Plan.

Implementation plans, which tier off of the *General Management Plan* and Merced River Plan, focus on "how to implement an activity or project needed to achieve a long-term goal" (NPS 1998). Implementation plans may direct specific projects as well as ongoing management activities or programs, and provide a more extensive level of detail and analysis. The *Yosemite Valley Plan* is an implementation plan that presents a comprehensive management plan for Yosemite Valley. The *Yosemite Valley Plan* guides protection of natural and cultural resources, opportunities for high-quality resource-based visitor experience, reduction of traffic congestion, and effective park operations. The Cascades Diversion Dam Removal Project would implement an action called for in the *Yosemite Valley Plan*.

Regulations and Policies

The Cascades Diversion Dam Removal Project Environmental Assessment is written within a complex set of regulations, policies, and approved plans. The project must not only comply with requirements of the National Environmental Policy Act, but it must do so within the parameters of other legislation (see Appendix A, Regulations and Policies) that govern land use within Yosemite National Park.

National Park Service Organic Act

In 1916, the Organic Act established the National Park Service in order to "promote and regulate the use of parks…" and defined the purpose of the national parks as "to conserve the scenery and natural and historic objects and wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." This legislation provides overall guidance for the management of Yosemite National Park.

The Prohibition on Impairment of Park Resources and Values

The Organic Act establishes the management responsibilities of the National Park Service. While Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that park resources and values be left unimpaired, unless a particular law directly and specifically provides otherwise. This cornerstone of the Organic Act establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that allows the American people to have present and future opportunities to enjoy them. National Park Service *Management Policies 2001* provides additional guidance on impairment of park resources and values.

Management Goals

Management goals identify long-range direction for Yosemite National Park. Any proposed project must carefully balance multiple goals, especially in a park as large and complex as Yosemite National Park. This section presents the goals set forth in Yosemite's *General Management Plan*, the Merced River Plan, and *Yosemite Valley Plan*.

General Management Plan Goals

The *General Management Plan* for Yosemite National Park sets forth five broad goals for management of the park as a whole. These goals include:

- Reclaim priceless natural beauty
- Allow natural processes to prevail
- Promote visitor understanding and enjoyment
- Markedly reduce traffic congestion
- Reduce crowding

Merced River Plan Goals

While the Merced River Plan adopts the five broad goals from the *General Management Plan*, it also outlines an additional set of goals for management of the Merced Wild and Scenic River. The main stem and South Fork of the Merced River were designated by Congress in 1987 for protection under the Wild and Scenic Rivers Act. The National Park Service developed the five goals of the Merced River Plan to further the policy established by the Wild and Scenic Rivers Act, namely to preserve designated rivers in their free-flowing condition, and protect and enhance the river's Outstandingly Remarkable Values. The Merced River Plan goals include:

- Protect and enhance river-related natural resources
- Protect and restore natural hydrological and geomorphic processes
- Protect and enhance river-related cultural resources
- Provide diverse river-related recreational and educational experiences
- Provide appropriate land uses

The Merced River Plan applies seven management elements to prescribe desired future conditions, typical visitor activities and experiences, and park facilities and management activities allowed in the river corridor. The management elements as they relate to Cascades Diversion Dam are discussed in Chapter V, Merced Wild and Scenic River. The Wild and Scenic Rivers Act Section 7 determination is included in Appendix B, Merced Wild and Scenic River Section 7 Determination.

Yosemite Valley Plan Goals

The *Yosemite Valley Plan* carries forward the goals of the *General Management Plan*. In addition, the *Yosemite Valley Plan* identifies four specific purposes of the plan. These include:

- Restore, protect, and enhance the resources of Yosemite Valley
- Provide opportunities for high-quality, resource-based visitor experiences

- Reduce traffic congestion
- Provide effective park operations, including employee housing, to meet the mission of the National Park Service

The *Yosemite Valley Plan* also identifies criteria for accomplishing the broad goals of the *General Management Plan* in Yosemite Valley and the specific purposes of the *Yosemite Valley Plan*. The criteria include:

- Protect and enhance natural and cultural resources
- Enhance visitor experience
- Provide effective operations
- Provide appropriate land uses

Issues and Concerns

The following issues were raised during the public scoping process conducted for this project (see Chapter VI, Consultation and Coordination) and by National Park Service staff. These issues are addressed in the analysis presented in Chapter IV, Environmental Consequences. Chapter II, Alternatives includes a description of issues and concerns that are addressed in other park plans as well as those that are beyond the scope of this project.

Natural Resources

Geomorphology/Hydrology

Cascades Diversion Dam has affected the natural flow, sediment deposition, and natural processes of the Merced River for over 80 years, altering the shape and nature of the river. The dam, in concert with other facilities, has disrupted the natural river processes and the functional relationship between the river and upland communities. These issues are addressed in the natural resources analyses presented in Chapter IV, Environmental Consequences.

Sedimentation, both during removal and over the long term after dam removal, has the potential to affect (either beneficially or negatively) downstream resources, including riparian habitats, fish and wildlife, swimming holes, beaches, and sandbars. Chapter II, Alternatives, and the natural resources analyses presented in Chapter IV, Environmental Consequences, address the question of whether to completely remove sediments behind the dam or to let natural river processes prevail. Public comment indicated that the type and percentages of sediment impounded by the dam should be discussed and potential disposal sites disclosed. These issues are addressed in Chapter II, Alternatives and in the natural resources analyses presented in Chapter IV, Environmental Consequences.

Concerns were raised that dam removal would have the potential to increase turbidity and decrease water quality of the Merced River, and that the project should include best management practices to avoid or minimize such effects. This issue is addressed in Chapter II, Alternatives and in the natural resources analysis presented in Chapter IV, Environmental Consequences.

Fish, Wildlife, and Plant Habitat

The Merced River corridor supports diverse aquatic and riparian habitats for plant and wildlife species. Natural habitats at the dam site have been altered by facilities and decades of human use. Concerns were expressed that dam removal should be designed to improve the environment and to avoid long-term adverse effects to the Merced River. Concern was also raised that uncontrolled dam failure could affect riparian habitat. These issues are addressed in Chapter II, Alternatives, and in the natural resources analyses presented in Chapter IV, Environmental Consequences.

The upstream impoundment created by the dam may contain species specialized to this slow-moving water environment. Dam removal would alter the existing local ecosystem, returning the area to a more natural state. Concerns were raised that species adapted to the impoundment could be adversely affected by the proposed action. This issue is addressed in the natural resources analyses presented in Chapter IV, Environmental Consequences.

Air Quality

Yosemite National Park is a Class 1 airshed (under the Clean Air Act) and therefore must maintain the highest standard of air quality. Dam-removal-related vehicle trips may temporarily affect local air quality. This issue is addressed in the air quality analysis presented in Chapter IV, Environmental Consequences.

Cultural Resources

Archeological Sites

As home to American Indians for thousands of years, the Merced River corridor is rich with archeological sites, both historic and prehistoric. Prehistoric sites are important for their research value and as a tangible link to the heritage of culturally associated American Indian people. Historic sites can provide information important to understanding past land use and management. Over the years, some of these sites have been eroded by river meandering or covered by river sediments. Facilities along the riverbanks have affected many of these sites. Some historic archeological sites, such as dumps, have been exposed; while these sites have scientific and interpretive value, they also pose environmental and public health hazards. This issue is addressed in the cultural resources analyses presented in Chapter IV, Environmental Consequences.

Ethnographic Resources

Yosemite National Park is part of a living tradition for local American Indian groups. Many places along the river corridor are important for traditional cultural uses and practices, including the gathering of plant materials for food, basketry, and other uses, and the conduct of traditional ceremonies. Many of these places and access to them have been affected by visitor use and park development. Ethnographic resources are addressed in Chapter III, Affected Environment.

Historic Structures and Cultural Landscapes

Historically significant structures and landscapes exist throughout the Merced River corridor. Cascades Diversion Dam is a historic structure, but one that restricts the free-flowing condition of the Merced River. Historic structures and cultural landscapes are addressed in Chapter III, Affected Environment.

Social Resources

Transportation

Cascades Diversion Dam is situated at one of the busiest intersections in the park, at El Portal Road and Big Oak Flat Road. Roadside parking provides informal recreational access to areas used for such activities as sightseeing, photography, and fishing. Measures may be necessary to manage transportation and access during dam removal. Concern was also raised that uncontrolled dam failure could affect El Portal Road. These issues are addressed in the transportation analysis presented in Chapter IV, Environmental Consequences.

Scenic Resources

The Merced River offers beautiful views of the river itself and of the surrounding landscape. Although unnatural, the dam provides an interesting view of the calm impoundment upstream and the downstream rushing cascades of the gorge. This issue is addressed in the scenic resources analysis presented in Chapter IV, Environmental Consequences.

Recreation

Sightseeing, photography, and nature study are among the recreational activities available within the area of Cascades Diversion Dam. These activities may be temporarily affected during dam removal. Concern was also raised that uncontrolled dam failure could affect downstream recreational uses. These issues are addressed in the recreation analysis presented in Chapter IV, Environmental Consequences.

Other Issues: Planning Processes and Management

Plans and Policies

The Merced River Plan (NPS 2001a) identifies management zoning and management elements specific to the corridor of the Merced River. Implementation of the proposed action must conform with adopted goals and elements. This issue is addressed in Chapter V, Merced Wild and Scenic River.

Conflicts Between Protection of Natural Landscapes and Cultural Landscapes

The protection of one type of resource can sometimes involve actions that may be detrimental to other resources. For example, removal of Cascades Diversion Dam would affect the historic landscape of Yosemite Valley's hydroelectric generating facility, but would restore the free-flowing condition of the Merced River.

Relationship between the Cascades Diversion Dam Removal Project and the El Portal Road Improvement Project – Cascades Diversion Dam to Pohono Bridge

There has been considerable public interest in the possible future realignment of El Portal Road between the El Portal Road/Big Oak Flat Road intersection and Pohono Bridge. The National Park Service intends to remove Cascades Diversion Dam, let natural processes prevail through this reach of the Merced River, and allow the river to stabilize prior to planning, designing, or implementing any proposed future improvement to this segment of El Portal Road. Potential future designs would comply with the Wild and Scenic Rivers Act, the National Environmental

Policy Act, as well as other legislation and park planning documents and would be subject to public input and review. Although the Cascades Diversion Dam Removal Project is completely distinct from this proposed future action, the road improvement project is included in the cumulative impact analysis in this document (see Appendix E, Projects Included in the Cumulative Impact Analysis).

Organization of the Cascades Diversion Dam Removal Project Environmental Assessment

The preferred and alternative plans for removal of Cascades Diversion Dam and the evaluation of potential impacts of these alternatives are integrated in this document and will be referred to collectively as the Cascades Diversion Dam Removal Project Environmental Assessment. The contents of this document are as follows:

- Chapter I, Purpose and Need – The first chapter includes a discussion of the project's purpose and need, planning context, relationship to management goals and objectives, and the scope of this environmental assessment.
- Chapter II, Alternatives – This chapter discusses the No Action Alternative and action alternatives under consideration by the National Park Service for Cascades Diversion Dam and provides a set of summary tables comparing the alternatives.
- Chapter III, Affected Environment – This chapter provides an overview of the affected environment, or the existing condition of Cascades Diversion Dam and its surroundings, including natural resources, cultural resources, social resources, and facilities.
- Chapter IV, Environmental Consequences – This chapter presents the analysis of the potential impacts of each alternative. Supporting data are included as appendices.
- Chapter V, Merced Wild and Scenic River – This chapter analyzes the consistency of the proposed action with the management elements of the Merced River Plan.
- Chapter VI, Consultation and Coordination – This chapter summarizes the process of preparing and reviewing this document.
- Chapter VII, List of Preparers – This chapter lists the names and qualifications of the persons who are primarily responsible for preparing and reviewing the document.
- Chapter VIII, Glossary – This chapter defines the technical terms and acronyms used in this document.
- Chapter IX, Bibliography – This chapter lists the references cited in this document.